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Subject: **Timber Monitoring**
Fiscal Year 2001

To: Forest Supervisor

Introduction

On January 22, 2001, the following Monongahela National Forest personnel met at the Day's Inn Conference Room in Elkins, West Virginia, to discuss the Forest's (a) use of clearcutting, (b) planting of oak and conifer, and (c) findings regarding deer browse impacts on regeneration.

Dan Arling, Wildlife Biologist
Jane Bard, Forester
Lewis Blodgett, TMA
Gary Bustamente, Fire Management
Larry Dehaven, TMA
Barry Edgerton, Hydrologist
Jan Garrett, Ecologist
Laura Hise, Assistant Forest Planner
George Hudak, Timber Program Mgr
Glen Juergens, Silviculturist
Mike Owen, Forest Aquatic Ecologist
Harry Pawelczyk, Range Manager
Dick Reigel, Sale Administrator
Rodger Ridgeway, Sale Administrator
Roy Ryan, Engineering Technician
Tim Scherm, Sale Administrator
Melissa Thomas Van-Gundy, Silviculturist
Scott Wells, Forester

The objectives of the meeting were to (1) review direction from the *Monongahela National Forest Land and Resource Management Plan (Forest Plan)* in regards to the above three subjects*;* (2) compare *Forest Plan* management direction and standards/guidelines for these three subjects with the action the Forest has taken over the last few years; (3) discuss any changes in legislation, public values, scientific information, Forest Service policy, etc. that have occurred since the *Forest Plan* was authorized that have influenced the Forest's ability to implement the *Forest Plan* in regards to the above three subjects; (4) document how such changes have affected the environmental effects or outputs anticipated during *Forest Plan* development; and (5) identify *Forest Plan* management direction or standards/guidelines in regards to the above three subjects that may need revision in the future to address new information.

1. Clearcutting

A. Background

Silvicultural practices were an issue during Plan development (FEIS A-36 and A-37).

Page 4-25 of the *FEIS* stated, "The even-aged system of silviculture is the optimum system for regenerating desirable timber species such as black cherry, white pine, red spruce, oaks, yellow poplar, and white ash…Application of the even-aged system will create scattered openings of no more than 25 acres through the Forest. As the new timber stands grow and additional openings are created, more diversity of age classes will be established across the Forest. Cavity trees and snags will be retained according to standards and guidelines."

Clear-cut/shelterwood management will occur in MP 1, 3, 4, and 6.1 (*FEIS* 4-26).

FEIS pages 4-28 stated, "Clearcutting…permits the early selection and growth of tree species most valuable for wildlife food and cover. Mast producers can be selected over non-mast, or less desirable mast species. Tree spacing can be better controlled for canopy density, which influences understory conditions. Shelterwood cutting creates a forest area of varied tree sizes and ages, from seedlings to large timber in patterns and diversity that can best benefit forest wildlife…Clearcutting/shelterwood is the best way of reproducing trees and other vegetation that are intolerant to shade and more valuable to wildlife. Most of the best tree mast producers require abundant sunlight to flourish including oaks, cherries, walnuts, magnolias, and hickories."

The *Forest Plan* projected that between 1,563 and 1,687 acres would be clearcut annually. Between 1987-1999, an average of about 1,000 acres per year were clearcut (approximately 62% of the projected output). Since 1996, an average of only 150 acres per year have been clearcut, less than 9% of what the Plan projected.

The Plan stated that for MP 3.0 areas, "Even-aged management will be used when intolerant vegetation is the species objective or when needed for accomplishing diversity objectives. Clearcutting will be the normal regeneration cutting method to achieve these objectives. Significant exceptions include: shelterwood will be used, in lieu of clearcutting when needed for (1) regeneration of a particular species, or (2) visual resource management objectives; and deferred rotation cutting may be used to retain large trees well into the next rotation" (*Forest Plan*, p. 134).

For MP 4.0 areas, the Plan stated, "Even-aged management system will be featured… Clearcutting is the optimum method of regeneration cutting for the purposes of this management prescription..Significant exceptions include:

(a) In and adjacent to developed recreation facilities, single or group selection and improvement cutting will be the primary cutting methods;

(b) In shade strips, selection and improvement cutting will be the primary cutting methods;

(c) Shelterwood will be used, in lieu of clearcutting, when needed for (1) regeneration of a particular species, (2) visual resource management;

(d) Management of shade tolerant conifers (e.g. hemlock).

For MP 6.1 areas, page 174 stated, "The even-aged system of silviculture will be emphasized to create open understory conditions for turkey and diversity of stands for bear..Clearcutting is the optimum method of regeneration cutting..long narrow clearcuts with an undulating perimeter are preferred…" Significant exceptions or modifications are described on page 175.

The *Forest Plan* stated that timber harvest accomplishments should be compared with objectives by measuring the million board feet (MMBF) and acres by harvest method, management prescription, and timber type (*Forest Plan*, p. 256).

Appendix J of the *Forest Plan* evaluates alternative cutting methods and recommends the normal method for each important tree species on the Forest.

B. Items to Discuss

1. Why are we clearcutting less than the Plan projected?

The group noted that there are two aspects to this question. First, why is the MNF cutting less timber in general? Second, why is the Forest using other even-aged methods instead of clearcutting?

A. As the Fiscal Year (FY) 1999 Monitoring Report for the Monongahela National Forest (MNF) indicated, the volume of timber being offered for sale has been declining over the years. Several factors have contributed to the overall reduction in MNF timber harvests since the Plan was approved in 1986:

- National policy changes resulting from the Natural Resource Agenda initiated by Forest Service Chief Mike Domebeck.
- Downsizing of MNF staff.
- Unexpected discovery of threatened and endangered species (such as the Cheat Mountain salamander and West Virginia northern flying squirrel) in Management Prescriptions the *Forest Plan* stated would be managed for timber products.
- Evolving knowledge regarding threatened and endangered species habitat use that has lead to adjustments in Forest management activities.
- Adapting management practices to respond to new sediment and riparian information, especially adjacent to streams with greater than 25% fine sediment levels (e.g. reducing harvesting on sensitive soils; changing the method of harvest or not harvesting on very steep slopes; building fewer roads and skid trails to reduce soil disturbance; designing old and new roads to a higher standard to minimize sediment delivery to streams; and providing additional riparian habitat protection on a case-by-case basis).
- Adjusting the size and shape of cutting units to respond to new information regarding fragmentation effects.
- Escalating complexity of National Environmental Policy Act (NEPA) analyses and increased cost of planning in times of diminishing Forest Service budgets.
- Increasing public criticism of clearcut management.
- Mounting number of administrative appeals proceeding NEPA decisions.

B. Since 1995, the use of clearcutting has declined from an average of approximately 800 acres per year to less than 200 acres per year. The use of clearcutting has been waning on the MNF, and the use of alternative even-aged management techniques have been increasing, as a result of --

- Intensified scrutiny of clearcutting from the National and Regional levels of the Forest Service. In the early 1990's, Forest Service Chief Dale Robertson changed

national policy, directing Forests to noticeably reduce their use of clearcutting, and only use clearcutting when it was shown to be the optimum method for achieving specific management objectives.

- Emphasis on retaining "leave trees" to try to minimize the visual quality effects of timber harvesting (there's some debate on whether the public feels that retaining these trees reduces visual impacts).
- Efforts to provide structural diversity in regenerating stands to benefit various wildlife species.

2. *What other types of harvesting are we using instead of clearcutting?*

   In response to Chief Robertson's direction, the Monongahela National Forest created a team to study other harvest methods that could be used to meet the objectives for which clearcutting was intended to achieve. As a result of the MNF efforts, shelterwood cuts and two-age cuts began to be used instead of clearcutting. Over the past few years, the Forest has been retaining 20-30 square feet per acre of basal area in these regeneration units (this includes den trees and cull trees).

   Patch clearcuts and group selections were two other methods considered by the team. However, these methods were not encouraged because, under MNF site conditions, shade tolerant tree species (beech, maple, etc.) are able to successfully out-compete desired shade intolerant tree species (cherry, ash, oaks, etc.). Patch clearcuts and group selection methods do not create adequate light conditions to regenerate desired mast producing tree species (cherry, ash, oaks, etc.). They encourage the growth of striped maple, which provide no economic or little wildlife benefit and which inhibit the regeneration of desirable tree species; and their small openings encouraged the concentration of deer, which result in heavy deer browse of desired stems.

3. *Are the shelterwood and two-age cuts that are implemented on the MNF meeting the objectives clearcutting was intended to meet? Is regeneration being significantly affected? Under current practices, are black cherry, yellow-popular, and oaks being jeopardized? Discuss research findings (e.g. Gary Miller's, Clay Smith's, others?). Are we able to balance age classes with these other methods?*

   Clearcutting, shelterwood, and two-age cuts are all considered even-age regeneration methods. Assuming the basal area in shelterwood and two-age cuts are minimized, these methods will create a new stand and help meet age class distribution objectives. However, if basal area in shelterwood and two-age cuts are minimized to less than 20%, they may effectively become clearcuts with residuals.

   The group did not reach a consensus on whether the shelterwood and two-age methods being implemented on the Forest are meeting the objectives that clearcutting is known to achieve. It's difficult to tell yet because it takes years after a regeneration cut to assess the full effects. Gary Miller's research seems to indicate that two-age harvests that retain a basal area of 20-40 feet don't provide the regeneration and effects of even-aged management as hypothesized. If 20-40 feet of basal area is retained, the overstory shades out species intolerant of shade and stunts the growth of regeneration. Also, two-age management may not be providing the visual benefits hoped for.

   The group agreed that more information is needed to identify whether the shelterwood and two-age cuts that are implemented on the MNF are maintaining adequate species diversity and regenerating the shade intolerant species that are desired. The group agreed

that Gary Miller and/or others should be invited to present their preliminary research findings regarding two-age management.

Note: **Laura Hise and Tim Scherm followed-up on this item by inviting researchers to make presentations on April 26, 2001. Contact Laura at 304-636-1800, extension 219, if you are interested in viewing the videotapes of these presentations.**

4. *Which standards and guidelines, if any, need to be modified or dropped? Do additions to the Plan need to be made (e.g. definition of two-age method and other practices in Appendix J)?*

   The group went through applicable standards and guidelines and identified those that may warrant a closer look during Plan revision. We discussed the need to review, and potentially modify, the following items:

   - **Rotation ages** - Current science should be reviewed to confirm appropriate rotation ages for tree species. Rotation ages identified on page 132 and 172 may need to be revisited. For example, in Management Prescription 3.0 areas, should rotations be based on maximum age of species, loss of trees from mortality, economics, the point at which they are not merchantable, etc.?
   - **Age class distributions** - Standards may need to take into consideration that the distribution of age classes may vary depending on the ecological setting of an area.
   - **Size of even-aged regeneration units and exceptions to the 25-acre clearcut size** - *Forest Plan* pages 77 and 135 indicate that 25 acres is the maximum size clearcut, seed tree cut, or shelterwood removal cut under normal conditions. The group noted that 25 acres might not be the right quantity for maintaining some wildlife species (particularly in the case of some threatened and endangered species). Reasons for exceeding 25 acres may need to be discussed; the size of even-aged regeneration units should consider economics, policy, and ecology.
   - **Spacing of even-aged regeneration units** - Page 77 of the Plan states that openings will be spaced at least 1/8 mile apart and separated by manageable stands of trees. The group discussed whether small cuts that don't add up to 25 acres should be spaced closer.
   - **Definition of openings** – An opening is currently defined as a cutover area within which the vegetation is less than 20 percent of the height of the surrounding vegetation (p. 77). The group wondered if a better definition is needed to clarify the difference between what is frequently called an opening (i.e., area with permanent or semi-permanent grass/forb ground cover) versus a regeneration harvest opening.
   - **Snags and culls** – The number and type of snags (as well as the desired diameter at breast height) needed may vary depending on the wildlife species being featured in an area. Should this variability be taken into account in snag and cull guidelines such as those on page 129 and 167-168 of the *Forest Plan*? In some instances, snags may need to be created if they are not already present or not in sufficient supply.
   - **Percent of size classes** – Are the guidelines identified on page 129 being met? If not, it has implications on older classes. This may need to be changed if rotation age is changed.
   - **Frequency of entry** – Vegetative management is not being implemented in opportunity areas as frequently as allowed (see pages 133 and 172-173). This is

mostly because of the time it takes to conduct NEPA analyses (e.g. conducting more complicated analyses and receiving more appeals than imagined during the development of the *Forest Plan*) and complete timber sales (e.g. greater knowledge of vegetative management effects and increased measures to protect multiple resources has lead to more restrictions on timber harvest activities, resulting in longer timber sale contract periods and more frequent extensions). The implications of these delays need to be examined and guidelines modified to consider these effects. The definitions of quiet time and major projects also may need to be clarified (see pages 172-173).

- **Clearcutting as the normal regeneration cutting method** – For reasons previously noted, clearcutting has not been used as the normal regeneration method in the latter third of the *Plan* period. The sections discussing silvicultural systems (e.g. pages 134 and 174) may need to be reconsidered.
- **Diversity elements** – Page 166 states that elements of diversity will be dispersed throughout a compartment sized area. The group wondered what size was considered to be a "compartment sized area" since compartments can vary greatly in regards to size. This guideline needs to be reviewed to determine if it still makes sense considering the current knowledge of ecological diversity.
- **Grapevine management** – Grapevine management guidelines on page 168 may need to be reevaluated to increase flexibility. Over the years, Forest personnel have seen grapevines damage regeneration in clearcuts, two-age units, and shelterwood cuts (e.g. grapevines inhibit regeneration and injure the young stands). Some areas cannot be harvested because grapevines could not be treated. Management needs to balance grapevine contributions to wildlife habitat with regeneration habitat contribution. Are the effects to wildlife greater if grapevines are lost or if early seral habitat is lost?
- **Shape of clearcuts or other regeneration cuts** – Page 174 states that "long, narrow clearcuts with an undulating perimeter are preferred." This statement, as currently written, is not consistent with current scientific thinking. The shape of regeneration cuts should take into consideration the ecological setting of the area, and the management objectives for a given area. The following are just a few items to consider when determining the shape of cutting units. What species are being managed for? What will the fragmentation effects be for various species? Will browsing by deer increase, decrease, or be unaffected and how will regeneration be affected? Will the shape increase or decrease ground disturbance? Are longer skid trails needed?

Overall, the group recognized that the underlying problem with the existing *Forest Plan* is that it did not consider the ecological suitability of certain lands for the management prescriptions assigned to them.

For example, during *Forest Plan* development, one goal of Management Prescription 6.1 lands is to "focus on manipulation of the naturally occurring tree species composition to optimize hard mast production, age class distribution, and ensure a continuous mast supply" (Forest Plan, p. 165). Some areas of the Forest that are currently providing wildlife with a diversity of hard mast (red oak, white oak, black cherry, etc.) are doing so as a result of disturbances over time, especially major disturbances at the turn of the century. Some of these lands are more ecologically suited to growing northern hardwood species (species such as red maple, sugar maple, hemlock, birch) that produce little or no mast. The Forest has found it undesirable from an economic standpoint to try and force

such areas to produce mid-successional vegetation. Also, during project level analyses, a number of people have opposed management practices (such as clearcutting, herbicide use, prescribed fire, and tree planting) that are necessary to maintain mast in areas not ecologically suited for early successional species.

Over the years, as project level analyses have been conducted, the Forest also has learned that some land designations made during Forest planning are inappropriate due to extraordinary circumstances that exist in several areas. For example, some land designated as Management Prescription 3.0 (land on which the production of forest products is to be emphasized) support populations of endangered and threatened species, or have other extraordinary circumstances such as sensitive soils, wetlands, visual quality concerns, etc. All these circumstances reduce the amount of timber that can be harvested in an environmentally responsible manner.

5. *Do standards and guidelines need to be created (e.g. for layout, marking, distribution, site prep, etc.)? If so, why?*

   The group did not discuss this in detail. A meeting should be held in the future to discuss standards that may need to be created to reflect current scientific knowledge, andaddress observations we've made over the years, etc.

2. Planting Oak and Conifer

A. Background

The *Final Environmental Impact Statement (FEIS)* stated, "Succession of areas of low site productivity from oak to conifers will occur" (*FEIS*, p. 4-22). "Most of the conifer component is high elevation red spruce or low elevation white pine, which occurs on the east side of the Forest. Some hemlock is also found scattered through the Forest, but it is almost always found as an inclusion in other timber types and not in pure stands" (*FEIS*, 4-27).

"Succession of low productivity hardwood sites to conifer will increase the productive use of those sites for timber products. High quality pine will be substituted for low quality oak-hickory" (*FEIS*, p. 4-23).

See p. 4-24 of the *FEIS* for wildlife concerns as it relates to succession to conifer.

The *Forest Plan* stated "sites may be converted to conifers only if the site index is between 45 and 60 for the hardwoods occupying the site. Initial efforts will emphasize release of natural regeneration rather than planting. See also management prescription standards" (*Forest Plan*, p. 77).

Pages 148 and 177 of the Plan indicate that for MP 4.0 and 6.1 areas, trees and shrubs with a high value for wildlife habitat may be maintained (or in the case of 6.1 areas—will be encouraged) by planting, release, and pruning (an in 6.1 areas—fertilizing and grafting).

For MP 6.1 areas, the Plan stated, "Mast producing species will be planted when it is determined that natural regeneration will not provide an adequate future mast source" (p. 177).

Page 166 stated that in MP 6.1 areas, "The conifer component should ultimately range from 5% to 25% of the area. Conifer stands should be small in size, irregular in shape, and dispersed throughout the OA, if feasible." Page 177 stated, "Conifer species may be planted or controlled when needed to enhance vegetative diversity for wildlife."

B. Items to Discuss

1. *Discuss fire ecology as it relates to maintaining oak species on the Monongahela.*

   The existing *Forest Plan* did not recognize the role that fire has played in the development of the Forest's vegetation over time. Only about 25% of the Forest is naturally suited to fire management (this includes white pine stands)(see LTA information). However, fires that have occurred over the centuries, especially intensive fires that burned after the widespread logging of the early 1900s, played a large role in developing the current vegetative conditions of the Monongahela National Forest. If it hadn't been for these natural and man-caused fires, much of the oak species that exist in the Monongahela today would not otherwise exist on some of the sites, or at the magnitude, that it does today.

   The group feels future planning should take into consideration the ecological role of fire and the effects fire--or fire exclusion--can have on forest vegetation.

2. *Is it effective and economical to plant and tube oak (perhaps beyond a few stems) on non-oak site? Why or why not?*

   Oak species are present on many sites throughout the Forest today because of the events described under Item #1. Over time, oak may compete and regenerate on its own on poor sites. However, areas with high site indices are better adapted to growing Appalachian hardwood species; to try and maintain oak over time on these sites is not practical.

   Information learned since the *Forest Plan* was approved in 1986 indicates that it is not reasonable to expect to maintain 25% oak in all Management Prescription 6.1 areas. To regenerate oak on "non-oak" sites, even-aged management such as clearcutting, herbicide use, prescribe fire, and/or tree planting and tubing must be used. Over the years, some publics have opposed the use of such methods.

   Planting, tubing, and maintaining oak on non-oak sites has not proven effective or economical (see stocking survival checks, informal monitoring by timber sale administrators, timber management assistants, and foresters). Monitoring has shown that oak does not compete well in some ecological settings (non-oak sites). Tubes were used to try to increase oak survival on non-oak sites to give oak species a competitive edge. However, maintaining tubes has taken a lot of time and money.

   Instead of applying guidelines based on arbitrary boundaries, planners need to consider the ecological setting of an area and identify goals and apply guidelines that are feasible for that setting.

   For example, to maintain a diversity of mast-producing species, the following questions need to be asked -- What vegetative zone is being managed? What is the ecological landtype? Considering the landtype being managed, what management strategy is necessary to maintain a diversity of mast-producing species? Will it require minimal effort to regenerate desired species, or will actions such as clearcutting, herbicide use, planting, and fire be needed? Does it make sense from an ecological and/or economical perspective to implement intensive management techniques, and how does the public feel about using such techniques?

3. *On non-oak sites, is it better to maintain an oak presence, or to protect from harvest a few oaks per acre, rather than planting?*

   Routinely, regardless of the ecological setting of a stand, oak development in harvested stands is promoted by retaining oak as leave trees and planting oak seedlings. However,

experience shows that planting oak does not work under ecological conditions that are better suited for growing other tree species; in stands with high site indices and little existing oak, planting oak is expensive and seldom successful. Under such ecological conditions, retaining oak as leave trees is the most reasonable means of attempting to perpetuate oak in the stand.

The group acknowledged that *Forest Plan* standards should recognize the influence ecological conditions have on successful management; standards should not dictate that certain species (such as oak) must be maintained in areas that are not ecologically suitable and which require disturbance that may result in unacceptable resource effects or economic costs.

4. *Can Ecological Classification Systems (ECS) give us a better idea of where to plant oak? Has ECS been successfully used for this purpose?*

   The Forest needs to improve its LTA/ELT information so it can be used as a guide for determining where, and where not, to maintain or plant oak. The Forest's ecological classification system is not yet developed enough to be used to predict where and where not to maintain or plant oak species. Until it is developed further, past observations can be used to make a determination of oak suitability on a case-by-case basis.

5. *Is enough done to maintain oak in young stands? Do more timber sale improvements need to be done in young stands to nurture oak?*

   Prescribed fire might need to be used in some areas; however, it is not feasible in much of the Forest because of the moist site conditions and limited window for burning. Prescribed fire may be best to use on mid to poor sites, and not used on worst or best sites. Prescribed fire is not required, generally, on poor site because oaks compete well in these stands. On the best sites--those with higher site indices--prescribed fire has little chance of success at regenerating oaks because of physical site factors (moister sites, possibly sensitive soils) and increased competition. Prescribed burns may need to implement on oak sites before harvests are implemented (1, 2, or 3 years before). This would fall into the category of prescribed burning for ecological restoration, wildlife habitat, and fuels.

   Release treatments are usually needed to allow planted oaks or natural oak regeneration to become established in the overstory. During opportunity area and watershed analyses, the needs for oak release in young stands have been, and will continue to be considered.

6. *Should whole stands be planted to conifer? Should natural regeneration and release of conifer in mixed stands be more aggressive promoted? Why or why not?*

   Planting whole stands to conifer may be feasible to meet defined objectives; however, it may make more ecological and economic sense to encourage the natural succession of conifer rather than to plant conifer.

   At one time, "At least 445,000 acres of red spruce occurred within the Monongahela National Forest"[1]. Since massive cutting and destructive fires at the turn of the century, much of this vegetation has shifted to early to mid-successional vegetation types; only about 20,000 acres of the Forest are currently conifer stands.

   Over the years, the Forest has learned that it is important to tie vegetation goals to landtype associations, rather than arbitrarily linking them with management prescriptions goals that may not be feasible to accomplish the ecological conditions of a given areas. For example, the MP 6.1 guideline for providing 5% conifer does not always make sense

in some opportunity areas because their ecological conditions are not suitable for such management; five percent may be too little, or it may be to much.

For example, white pine and red spruce appear to be increasing naturally. About 15% of the eastern part of the Forest could succeed to white pine. Over 50% could succeed to a red spruce community[1] (1Clarkson, R.B. 1966. The Vascular Flora of the Monongahela National Forest, West Virginia. Castaneda 31(1)).

Hemlock also is likely to be a major component of stands in the future because the absence of fire is allowing it to increase naturally over time. Hemlock is an important component of the endangered West Virginia Northern Flying Squirrel's habitat. It is typically found mid slope or along streamsides. When hemlock exists in the understory of a stand to be harvested, it is generally retained. Under this practice, and with the continued exclusion of fire, hemlock is likely to increase naturally over time without planting.

Red spruce is another conifer species important for managing West Virginia Northern Flying Squirrel (WVNFS) populations. The group discussed whether, if seedlings were not available, would it be worthwhile to plant red spruce. In most cases, it is not economical to plant red spruce, and on many sites, conifer planting may only accelerate natural conifer occupancy (if not replicate it) by a few years.

The group noted that research is needed to determine the best methods for managing the conifer component of WVNFS habitat. A research permit and research cuts are needed to determine the best means of providing WVNFS habitat. One research project may be designed to allow thinning of existing northern hardwood stands to encourage spruce to increase in the overstory. The public has expressed opposition to converting hardwoods (especially oak species) to conifers, so research would have to take this into consideration.

7. *What changes to Forest Plan standards and guidelines may need to be considered?*

   The group reviewed Management Prescription 3.0 and 6.1 standards and guidelines. The group agreed that we still need planting as a tool, but not necessarily a requirement.

   On page 177 of the *Forest Plan*, the group suggested that "will" be changed to "may" in the following guideline: "Mast producing species <u>will</u> be planted when it is determined that natural regeneration will not provide an adequate future mast source."

2. Deer Browsing

A. Background

The *Forest Plan* didn't specifically address deer browsing, but page 250 stated that management would ensure stands are adequately restocked within Five years. See regeneration standards and guidelines in the Plan.

B. Items to Discuss

1. *Are deer populations increasing in some areas to the point that adequate regeneration is not occurring? What other factors, if any, may be contributing cumulatively to regeneration problems?*

   - There are areas, such as Hunter's Haven on the Gauley District, where deer browse is inhibiting adequate regeneration. There are lots of variables that cause inadequate

regeneration and the damage varies. For example, the following observations have been made by Forest personnel--

- An increased mast crop in an area may result in decreased deer browse in any given year.
- Deer browsing impacts on regeneration are more severe in harvested units located at higher elevations. The worst deer browse problems have occurred at 3,000 to 3,600 feet.
- Deer browsing in regeneration units located near private land is high, possibly due to the lack of hunting permitted on private land.
- Deer browse damage is greater in areas near winter beds.
- Deer browse is greater in areas where roads are gated than in areas where roads are open to public motorized vehicle use.
- Browse is a problem in areas with both low and high site indices (see page 132 for definitions of low and high sites). Timber personnel have not noted a correlation between deer browse damage and site index.
- The combination of deer and the existence of fern in the understory cause a high degree of regeneration failure. Add the existence of beech and competition for sunlight, water, and nutrients increases and further inhibits the success of regeneration. Some personnel who have been monitoring regeneration success feel deer browse is increasing fern dominance in stands; but Forest personnel have not documented their monitoring to verify their observations, or researched recent literature to determine if this is true.
- Deer browse leads to the increased occurrence of striped maple.
- Deer browsing damage sometimes has occurred in regeneration units even in areas where West Virginia Division of Natural Resources (DNR) information indicated deer densities were low (note: DNR's information evaluates deer densities at the County level and might not necessarily indicate local deer densities).

2. *Are uneven-aged or even-aged systems appropriate in areas of high deer densities?*

   Some members of the group believe uneven-aged management is the worst method to use in areas of high deer populations because deer concentrate in the small openings and wipe out the regeneration.

   Even-aged regeneration is appropriate in areas of high deer browse; however, standards may need to be adjusted to meet site conditions. For example, the Forest may not want to follow the *Forest Plan* guideline of creating long and undulating units in areas experiencing extensive deer browse because such units would create a high degree of edge that would encourage increased deer browse and increase the chance of regeneration problems. Instead, in areas of high deer browse, it may be better to increase the size of units, concentrate them, etc. to distribute and minimize browse impacts in regeneration units.

3. *What tools or methods, if any, are needed to identify and avoid adverse deer densities?*

   The best tool needed to deal with deer browse problems is knowledge of the history of a given area. Documentation has not been kept over the years to help track the areas that have historically experienced severe deer browse. Foresters and timber sale

administrators have this historical information in their memories but have not documented it on paper; so when they move or retire, this information will be lost. It would be easier to develop strategies to manage deer browse effects if such information was documented.

The following are some other items that can be done to predict and deal with potential deer browse problems:

- Identify known pathways for deer, such as ridgetops or other topographic features.
- Track deer browse observations on stocking surveys and use these surveys to compare the effects of similar areas.
- Conduct pre-harvest surveys in proposed regeneration units. Existing deer browsing effects and presence or absence of fern should be noted. If deer-browsing damage is noted before a timber harvest, especially if fern exists in the understory, it is likely the cut unit will have trouble regenerating.
- Consider using pellet count surveys. In the past, the WV Division of Natural Resources has said pellet count surveys are very expensive and not that useful. The Allegheny National Forest (ANF) uses these counts; group members wondered how much these surveys cost the ANF and want to learn how such surveys have helped them. Foresters may want to visit the ANF to see how they are dealing with their deer-browsing problem or invite ANF personnel for field trips on the Monongahela.

The group wasn't sure, but wondered if deer regeneration is more of a problem on certain soil types or on certain aspects. Documenting and tracking deer browse would help answer this question.

4. *What remedies exist to address deer browsing concerns? What are the pros and cons of–*

a). Harvesting in the winter to help reduce deer browse effects?

If cutting is done in the summer, deer are more likely to browse on regeneration because other food sources are scarce. This browsing reduces the energy supply in the roots of the new regeneration and makes it more difficult for them to flourish.

Cutting in the winter should help reduce the effects of deer browse for several reasons. First, additional food sources are available for deer in the spring, so deer are less likely to browse the regeneration until much later in the year. Such a delay in browsing will allow more energy to be stored in the roots of the regeneration, so that they'll flourish and grow faster. Also, the slash remaining after a winter cut will not have had time to breakdown and will provide better protection for regeneration than slash that has been decomposing since summer.

b). Increasing hunter access or providing special deer hunts off certain roads or in certain areas?

One means of reducing deer browsing would be to open gated roads to vehicular traffic during hunting seasons two to three years before timber is harvested—encouraging the public to hunt in remote areas that are experiencing severe deer browsing.

Opening more areas to "Q" permit hunting and allowing special hunts (such as youth hunts) **prior to a regeneration harvest** may also be a way of reducing deer populations and increasing the chance of regeneration survival in those areas that are currently suffering from high deer browse. Such hunts should concentrate on removing does from the population.

The Forest would want to work closely with DNR and document the results on deer browse if more areas are opened up to hunting prior to timber harvesting. The Forest would need to find out whether additional Class Q hunting areas or special hunts would be feasible and how they would be administered. For example, the Gauley Ranger District has offered youth hunts in some areas experiencing high deer browse. Although results were mixed, in general, group selection cuts on the Gauley regenerated better since youth hunts were conducted.

Another factor to consider is that not all roads are built to a standard that would allow vehicular traffic during the hunting season without adversely affecting other resources (e.g. increase erosion, increase stream sedimentation, etc.). Thus, all affected roads would have to be improved prior to use and maintained periodically during use.

The Forest also would need to advertise the roads that would be open, provide maps or regeneration harvest areas to hunters, and increase road maintenance on affected roads. The miles of road open in any given area at any one time would need to be tracked, since the *Forest Plan* indicates that only so many roads can be open in 6.1 areas at a time.

c). Fencing regeneration units?

More information needs to be obtained to determine if this is practical given the conditions on the Monongahela. Would it be economically feasible? The Allegheny National Forest uses electric enclosures, but the ANF has cherry that makes it more economically feasible to finance such enclosures. It also has flatter land than the Monongahela NF.

d). Leaving tops and limbs to protect regeneration and minimize slash removal?

More site prep could be completed and larger trees could be felled and retained to provide more slash and protect sprouts. The Forest could also leave small pulpwood and more top-wood and not lop and scatter slash (unless needed for visual concerns).

e). Others?

The group discussed the feasibility of fertilizing harvest units to improve regeneration growth, improving its chance of surviving deer browse. The group needs to research and gather more information to know what may be lacking and what may need to be added.

5. *Will any of these remedies conflict with other standards? If so, which ones? What standards, if any, need to be developed to address deer browsing concerns?*

   The group ran out of time and didn't go into detail about this. The group did note that a standard could be created to require deer browsing to be tracked on stocking surveys.

/s/ Laura Hise

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